

Purushotham Sirasapalli

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EDUCATION

University at Buffalo

Bachelor of Science in Computer Science, Minor in Mathematics | GPA: 3.5/4.00

Buffalo, NY

August 2022 – May 2026

EXPERIENCE

Undergraduate Research Assistant, SCORE Lab

May 2024 – Present

University at Buffalo

Buffalo, NY

- Developed **Coriolis-Lite**, a lightweight metagenomic classifier using **sdsl-lite** to store reference databases as FM-indexes, enabling memory-efficient exact-match classification on mobile devices.
- Adapted SKiM (Short K-mers in Metagenomics) to run on edge computing devices, achieving a **6×** execution-time speedup over the mmap-based implementation.
- Improved k-mer query throughput in SKiM by benchmarking hashing algorithms and caching libraries across **63M keys**, replacing the hash-based index with minimal perfect hashing and a faster caching implementation.

Undergraduate Research Assistant, ADAMS Lab

Dec. 2024 – Present

University at Buffalo

Buffalo, NY

- Led development of a decentralized swarm robotics system for signal source localization, deployed on **4 physical robots** and validated with up to **50 agents** in simulation, with a paper submitted to **IROS 2026**.
- Designed the distributed inference pipeline using Bayesian Optimization and Gaussian Processes, enabling real-time cooperative source tracking without a central coordinator.
- Trained an RL policy for vision-based aerial target tracking, achieving stable tracking at **10 m/s**, a **5× improvement** over PID-based controllers.
- Reduced GP inference overhead for mobile deployment via a lightweight CNN-based downsampling architecture, enabling real-time operation on resource-constrained hardware.
- Designing a bi-level optimization framework jointly tuning BO hyperparameters and robot hardware parameters (geometry, velocity, battery) to maximize swarm localization performance.

Student Leader, 3 Pillar Catering

Aug. 2023 – Present

University at Buffalo

Buffalo, NY

- Led a team of 10+ student staff in a high-volume catering operation, managing shift logistics and onboarding for events of up to **1,000 guests**.

Software Engineering Intern

Feb. 2022 – May 2022

Foundry Medical Technologies

Visakhapatnam, India

- Implemented and validated embedded control logic for a medical ventilator across adult and pediatric modes, conducting mode-level hardware testing to ensure compliance with safety and performance standards.

PROJECTS

Decentralized Signal Source Localization for Swarm Robots | ROS2, Python, PyTorch

- Implemented distributed GP surrogate models with online updates across the swarm, achieving robust source estimation under real-world RF, LoRa, and WiFi signal conditions.
- Built the ROS2 communication and sensor integration stack on TurtleBot platforms running Ubuntu 22.04, enabling decentralized decision-making across the swarm.

Bi-level Optimization for Swarm Robotics | Python, PyTorch, ROS2, OpenAI Gym

- Designing a two-way optimization framework jointly tuning BO hyperparameters and robot hardware parameters (geometry, velocity, battery) to maximize swarm localization performance.
- Formulated robot morphology and mission configuration as co-optimization variables, enabling hardware-aware algorithm design for real-world swarm deployment.

TECHNICAL SKILLS

Languages: C/C++ · C# · Python · Rust · Java · Go · JavaScript · SQL · PHP · HTML/CSS

Frameworks & Tools: PyTorch · Stable-Baselines3 · OpenAI Gym · scikit-learn · NumPy · ROS2 · Gazebo · Hadoop · Spark · React · Git · Linux